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DISCOVERER OF WHITE INDIANS PLANS NEW PANAMA EXPEDITION

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An expedition to penetrate unknown territory of Panama occupied by the White Indians discovered this spring by R. O. Marsh, American civil engineer and explorer, is being organized in Washington, D. C. with the cooperation of leading scientific institutions.

The Marsh expedition, which returned to the United States in July bringing with it three White Indian children and five brown Indians of the region, explored a large area of territory never before entered by white men. But the country occupied by large settlements of the unique White Indians was not entered, though flown over by airplane, and will be the objective of the party to leave this country in January.

The party of Darien Indians, including the two White Indian boys, Marguerite, a fourteen year old White Indian girl, her father and mother, both brown Indians, and three grown brown Indian men, one of them a leading chief, has spent the summer at Mr. Marsh's summer home near Prescott, Ontario, on the St. Lawrence River.

The party is now in Washington where they were recently presented to President Coolidge and studied by the scientists at the Smithsonian Institution, the U. S. National Museum, National Research Council, and the Carnegie Institution of Washington.

In the summer of 1923 Mr. Marsh while exploring in the Darien region of Panama saw and photographed at long distance seven White Indians who had come to a settlement in the lower waters of the Chucunaque River. Legends of large White Indian settlements led him to equip and head a scientific expedition to explore the unmapped country into which the Indians have previously allowed no white men to penetrate. Before the explorations by land, Mr. Marsh, with the cooperation of the U. S. Army, conducted an airplane reconnaissance of Darien that revealed major mistakes in existing maps.

The San Blas Indians who occupy the Atlantic coast of the Darien region have never heretofore allowed white men to stay overnight within their territory. Mr. Marsh entered the country from the Pacific side and after a hard journey up the Chucunaque River and over the San Blas Mountains, he arrived at the "back door" of the San Blas tribes. By tactful treatment of the Indians and by furnishing them medical assistance, he finally won the confidence of the chiefs. Until he got the cooperation of the Indians he was unable to see even one White Indian at close range; once the San Blas Indians were won as friends, four hundred White Indians were summoned for Mr. Marsh's inspection and he was allowed to bring three of the

children to the United States.

Among the brown San Blas Indians of the Darien coast the White Indians are outcasts. They are forced to live in segregated settlements on the south or Pacific side of the mountains along the coast. White Indian children are sometimes born of brown Indian parents who are of a distinct and stockier build than the typical San Blas Indian and who have White Indian ancestors. These white children are allowed to remain in the coast settlements only until they are old enough to look out for themselves. Then they are banished and sent into the White Indian settlements up in the mountains.

The anthropologists, ethnologists, and biologists who have examined the White Indians have been unable to agree upon any cause for their white skin, hazel-brown eyes, yellow hair, and red gums combined with Indian features of a superior type. Among the theories of causes and origins that have been suggested are:

1. The White Indians are called albinos or partial albinos. This is a name that does not explain their origin nor does it take into account the albinism found among other races whose hair and eyes are totally devoid of pigment. Some anthropologists have called the White Indians albinos, while other anthropologists and biologists declare that they do not exhibit albinism as they understand it.

2. Some disease or pathologic condition has prevented pigmentation and this lack of coloring matter in the skin has become so fixed in the race that it is inherited from generation to generation as an acquired characteristic. The White Indians are not sick in the ordinary sense of the word, and the three White Indian children brought to this country by Mr. Marsh are in better health and more mentally alert than the average white child.

3. The White Indians are the beginning of a new white race, perhaps duplicating what happened many thousands of years ago when the present white race was evolved from dark skinned stock. If this is so, the White Indians are what is known as biologic "sports", a condition of extreme scientific interest because of its bearing on the biological problems of men.

4. The White Indians are the result of a mixture of white or Nordic blood with the brown Indian blood. If this is so it must have occurred many years before Columbus discovered America, because his records and those of Balboa and later explorers tell of White Indians in Central America and Panama at the time of their explorations. One suggestion is that the Vikings and Norsemen who discovered and settled New England in the twelfth century found the climate too cold for them took to their ships, went south and mixed with the Maya and Aztecs of Mexico, who later emigrated to Panama, becoming the ancestors of the present White Indians. There are records also of a Welsh nobleman sailing with a large company in the direction of America in 1207 and some believe that an admixture of these early voyagers resulted in the White Indians seen by Balboa and now discovered by Mr. Marsh.

Frankly, scientists are unable to determine the cause and origin of the White Indians, although they consider that Mr. Marsh's explorations have resulted in a major ethnological and anthropological discovery. Dr. Ales Hrdlicka of the U. S. National Museum said:

"The phenomenon deserves a thorough scientific investigation, and Mr. Marsh deserves the thanks of American and British anthropologists for having brought to their attention a subject of considerable scientific interest and importance."

The 1925 Marsh expedition to Darien including, it is hoped, geneticists, ethnologists and anthropologists, will have the task of solving this unique racial mystery.

Mr. Marsh intends to take the five brown Indians back to Darien with him, but he hopes to be able to keep the three White Indian children in this country and educate them in American schools.

MAGNETIC MACHINES SAVE COAL NOW LOST IN CLINKERS

Electro-magnets of great power are used in new types of fuel-saving machinery, to pick the clinkers out of the unburned coal. The first successful tests of these machines in this country are described by Rudolph Kudlich, of the Bureau of Mines, U. S. Department of the Interior.

The principle underlying the new type of clinker separator depends on two simple facts; first, that clinkers and coal do not fuse together, and second, that practically all clinkers contain a little iron and are therefore weakly magnetic. The new machines pass crushed furnace wastes under electro-magnetic drums, which lift out the magnetic clinker particles and permit the non-magnetic coal to pass on, to be returned to the bins.

Savings well worth figuring on may be effected by salvaging unburned coal from furnace wastes. One well known combustion engineer estimates that the average amount of combustible in the refuse from a large stoker fired central station boiler plant is about fifteen or twenty per cent. Assuming that the coal burned contains twelve per cent. of ash, and allowing for flue dust losses, approximately two per cent. of the original coal is thus carried out, unburned, in the ashes.

Most of the methods of coal salvage at present in operation involve the use of water, to float off the light particles of half-burned coal, while the heavier clinkers sink. Such systems, however, are claimed to be less efficient than magnetic separation.

The magnetic method has already been tested in Europe, where fuel costs present even more serious problems than they do in this country. Tests reported by a German firm showed recoveries up to eighty-seven per cent. of the combustible in the refuse.

RICKETS CURED BY ULTRA VIOLET LIGHT CAPTURED BY FOOD

The mystery of why rickets can be cured by so dissimilar treatments as administration of codliver oil and exposure to sunshine has been solved.

Cod liver oil and other substances curative of rickets are bottled sunshine.

When substances curative of rickets are exposed to the air or utilized in the body, they actually give off ultra-violet light, the same sort of radiation to which the sunlight and the radiations from mercury quartz lamps owe their effectiveness.

This is the discovery just announced from the Department of Pediatrics of Yale University by Prof. I. Newton Kugelmass and Dr. Irving McQuarrie. And

Dr. Walter F. Baughman and George S. Jamieson of the Bureau of Chemistry of the U. S. Department of Agriculture also report that oils and fatty acids, such as the substances curative of rickets and those exposed to the sun, give off a radiation strong enough to darken a photographic plate.

The recent work of Prof. Harry Steenbock of the University of Wisconsin has shown that various foods, not antirachitic, when exposed to the sun become as effective in preventing rickets as foods containing the antirachitic vitamin. Dr. A. F. Hess of Columbia obtained the same effect from cottonseed oil exposed to ultra-violet rays from a mercury lamp. It is also known that children and young animals who get frequent sunbaths do not develop rickets whether they receive antirachitic factor or not. It seemed reasonable, therefore, that sunlight changes foods in some way, converting part of their substance into the antirachitic vitamin, or at least something "just as good."

The experiments of Prof. Kugelmass and Dr. McQuarrie showed that substances curative of rickets, like cod liver oil, as well as substances lacking in that power, produced photographic effects on the plates when placed in close proximity. But the curative substances produced a stronger effect than the others. They would work through screens of quartz, while the non-curative substances would not. This proves that the photographic effect was due to ultra-violet rays and not to ordinary light, because none of the substances could work when separated from the plate by ordinary glass, which is opaque to ultra-violet. It seems clear therefore that the curative effects of the antirachitic diet is bound up in some way with the giving off of ultra-violet rays by substances in the food.

An entirely new effect was noted in these same experiments. All of the food materials studied, whether they were in themselves curative or not, became capable of affecting photographic plates when they were treated with oxygen. When the oxygen was driven out again, they lost the power. And the more highly oxidized the substances became, the more strongly could they affect the plate. The scientists conclude that the power of giving off ultra-violet rays, and therefore the value in the treatment of rickets is dependent upon oxidation.

The Yale scientists conclude: "These experiments point strongly to the common property of emitting ultra-violet rays, of cod liver oil, egg yolk, sperm oil, bile, hydroquinone on the one hand and of sunlight or quartz mercury vapor radiation on the other, as the basis for their identical curative action in rickets.

"The experiments may be applicable to physiologic phenomena in general. Not only do they suggest the mechanism common to all rickets-healing processes and imply a method to measure the therapeutic potency of the curative agents but they also disclose the fact that solar energy exerts a hitherto neglected function in the physiology of higher organisms as well as in plants."

In the Department of Agriculture experiments, dishes containing various oils and substances chemically derived from oils were covered with photographic plates and left in the dark from two to eighteen hours. The plates then were developed, and it was found that many of the substances had given off rays capable of making a photographic image. The oils do not seem to have this power by themselves, but gain it from exposure to sunlight.

"Freshly pressed vegetable oils or rendered fats are not active but exposure to sunlight for several hours causes them to become active," say Dr. Baughman and Mr. Jamieson. "Heating to approximately 120 degrees Centigrade for several hours destroys or greatly reduces the activity. Plotting paper placed over very active oils becomes permeated with the active substance and capable of affecting a plate."

TWENTY-EIGHT DAY MONTH ADVOCATED BY WEATHER BUREAU CHIEF

A new arrangement of the calendar, embodying the ideas of Prof. Charles F. Marvin, chief of the U. S. Weather Bureau, was presented before the recent meeting of the International Geodetic and Geophysical Union at Madrid, Spain.

Prof. Marvin has long believed the present division of the year into twelve months of unequal length is awkward and should be changed. He likens the present calendar, in which the length of the months varies from twenty-eight to thirty-one days, to a confusing yardstick which would sometimes measure thirty-six inches and sometimes thirty-eight or thirty-nine. He believes that much convenience would be gained by both business and science if months were always of equal length and always began on the same day, and he has devised a calendar on that basis, which was presented before the meeting.

Prof. Marvin's calendar is very simple. The year is divided into thirteen months instead of twelve, and each month has exactly twenty-eight days. Each page of his calendar would look like this:

Sun.	Mon.	Tue.	Wed.	Thu.	Fri.	Sat.
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28

There would never be any change. All months would have the same days on the same dates, forever.

This thirteen-month year would have one day, the 365th, left over. Prof. Marvin proposes to stick this odd day in somewhere between Christmas and New Year's, as an additional holiday. In leap years another day would be inserted between two midsummer months, as a midsummer holiday.

A number of advantages to business in the proposed arrangement are pointed out. The beginning of each month, and the beginning of the year, would always be also the beginning of a week - a considerable matter in the ordering of office routine. People who are paid by the month or semi-month would always have Saturday for payday. Legal holidays that now shift, like Christmas, New Year's, and July 4, would always come on the same day of the week.

Religious festivals that move about, like Easter, could be given a definite date. Authorities of the Roman Catholic, Eastern Orthodox and Anglican churches have agreed that a fixed date for Easter could be arranged.

The last calendar reform occurred in 1582, when Pope Gregory XIII revised the old Julian calendar, which had been in use since the time of Caesar. The Julian calendar had allowed too many leap years, and in the course of centuries an error amounting to eleven days had crept in. It took some time for Gregory's calendar to be adopted, but long before the beginning of the nineteenth century all western nations except Russia were using it.

Russia clung to the Julian calendar until 1923, when the Soviet government brought its dates into agreement with those of the rest of the world. The calendar adopted in Russia last year contains one very slight modification, designed to

offset a minor inaccuracy left in the reckoning by Gregory; but this is of interest only to astronomers, since the change is not to take effect until the year 2000, and the error is so small that it will not amount to a full day until the year 4600.

The proposed new calendar is even more closely calculated than the latest Russian model. But one unescapable source of error still intrudes. It is known now that each year is shorter than the one preceding by a very small particle of time. The difference amounts to fifty-three one-hundredths of a second in a century. Prof. Marvin states that by the time this unavoidable error introduces a difference of one day in his method of reckoning, it will be the year 13,000 A.D.

MODERN SCIENCE BACKS ANCIENT HEBREW BELIEF

A sanitary regulation dating from the time of Moses has been shown to have a valid scientific foundation, by the investigations of Dr. David I. Macht and Dorothy S. Lubin, of the pharmacological laboratory of the Johns Hopkins University.

The ancient priestly laws of the Hebrew Pentateuch declare that women are "unclean" - "not kosher" - during the recurrent physiological crisis that comes once every lunar month. So stringent were the regulations, as given in Leviticus, chapter 14, verses 19 to 30, that any one who so much as touched them or any article of furniture used by them was declared unclean also.

Similar beliefs lie at the base of some of the "taboos" of present-day savages, and survivals of these primitive ideas still hold in rural parts of civilized nations. For instance, Dr. Macht points out that in the silkworm raising and perfume industries in France women are not permitted to work during the times of their malaise.

Such customs have come to be regarded as superstitions, but the work of the Johns Hopkins investigators shows that at such times women actually produce a powerfully poisonous substance in all parts of their bodies. They found that all the body fluids, saliva, blood, perspiration, even the tears and breath of menstruous women exert a toxic influence.

They made their tests by watering newly sprouted bean plants with very dilute solutions of these various fluids, and measuring their rates of growth as compared with check plants fed with ordinary culture solutions, and further checked their results by watering a third set of plants with fluids supplied by the same persons when they were in normal condition. It was found that the fluids supplied by their cooperators while they were "unclean" under the old Levitical law stunted the plants, in some cases slowing down the growth as much as forty per cent. Perspiration was especially strongly charged with the poison, for very small quantities washed from the skin into the culture solution had a marked effect. Perspiration of women in normal condition had little or no effect on the plants.

When women who were at their period held flowers in their hands for a few minutes they quickly wilted; but the flowers remained fresh when handled by normal women. The effect was notable on roses and carnations, and especially on sweet peas.

Another old belief is that at these times women should not make bread, for the dough will not rise. This was tested out by having women handle yeast, and

afterward testing its capacity to grow and produce carbon dioxide. It was found that the leavening power could be virtually destroyed by the toxic substance in the perspiration, though under normal conditions the yeast retained its full strength. Certain bacteria were also killed by the same treatment.

Under the microscope the effect of this unknown poison could be watched, as it paralyzed and partly broke down the living protoplasmic substance in plant cells. It was noted that the poisonous action on plant protoplasm was stronger than it was on animal.

Extracts made directly from the sexual organs of pigs showed similar toxic action. Body fluids of female animals taken under the same circumstances as those prevailing in the human experiments were also poisonous, though the intensity differed. Female monkeys produced much toxic substance, rats an intermediate amount, and dogs hardly any.

RUBBER COATED FRUITS SHIPPED FROM TROPICS

Dipping in rubber latex, already a familiar process in tire manufacture, promises to become an important process in the fruit trade, according to a report to the Pan-Pacific Union by Dr. P. J. S. Cramer, a Dutch botanist of Buitenzorg, Java.

Dr. Cramer has shipped fresh strawberries with rubber coats without loss of flavor or texture, though the trip lasted fourteen days. He has shipped latex-dipped ripe mangos, and the mangosteen, which is considered the most delicate and hard to ship of all tropical fruits, from Buitenzorg to Paris, where they arrived in perfect condition.

The success of the process depends on the formation of a thin, airtight film over the surface of the fruit. The exclusion of oxygen stops the physiological processes, and no changes take place until the rubber film is stripped off again. During his experiments, Dr. Cramer dipped one end of a green banana in latex and left the other end as it was. The uncoated part went on and ripened, while the coated end remained exactly as green as it was at the start. Similarly, ripe fruits when dipped simply remain ripe and do not go on to over-ripeness and deterioration.

Dr. Cramer's process may become the basis of very important developments in the handling of tropical produce. Refrigeration in the tropics is expensive, and some of the choicest fruits, like the mangosteen, cannot be shipped even when refrigerated. Rubber latex, on the other hand, is inexpensive and abundant throughout all the hot countries, and its use is expected to have the advantage of economy both in cost and in the utilization as shipping space of parts of cars and vessels now occupied by ice chambers and refrigerating machinery.

Certain tropical hardwoods are so dense that they will not float in water when they are to be transported rafts of bamboo or lighter woods have to be built to carry the logs.

PORTABLE X-RAY AIDS PLUMBERS AND JEWELERS

The plumber, electrician, jeweler, and builder can now use X-rays to aid them in their work. Dr. W. D. Coolidge, inventor of the Coolidge X-ray tube, has devised in the research laboratories of the General Electric Company at Schenectady, New York, a new portable X-ray machine that weighs only 30 pounds and that can be plugged into an ordinary electric light socket. The whole apparatus is contained within a box less than a foot square and a push of a button produces the penetrating radiation.

Dr. Coolidge made first practical use of his new invention when he used it to locate pipes in his bathroom floor. Crystals produce characteristic diffraction patterns when a small beam of X-rays is shot through the stone and observed in a fluoroscope, allowing the new apparatus to be used in testing the genuineness of diamonds and other precious stones.

DO TRANSPLANTED EYES SEE? SCIENTISTS IN ARGUMENT

Do transplanted eyes see? Can the eye of an animal, taken out of its socket and transplanted into the head of another animal, or into the opposite side of the same head it was taken from resume its normal function?

Scientists of two continents are in dispute over the experiments of Dr. Theodore Koppányi at the University of Chicago. Obviously, if Dr. Koppányi's experiments are successful, they may eventually be of immense importance in surgery. But Prof. Joseph Imre, Jr., Dr. Koppányi's countryman, claims that successful transplantation has not been accomplished; while Prof. A. J. Carlson, in charge of the Chicago laboratory where Dr. Koppányi is working, states that the experiments have had at least partial success.

Numerous newspaper reports relative to the possibility of transplanting the eye aroused the controversy among scientists which comes to light in the Journal of the American Medical Association.

Professor Joseph Imre, Jr., head of the department of diseases of the eye in the State University of Pecs in Budapest, points out that he considers it his moral duty to relate the results of investigation in this connection. His investigations have shown him that Dr. Koppányi, a biologist, performed experiments on rats and rabbits in attempts to find out whether or not an animal with a transplanted eye could see. According to Prof. Imre, Dr. Koppányi cut the muscles and cut tissues around the eyeball and left the eye in place, and there was no proof that the optic nerve was cut through. He says, furthermore, that in every case in which the operation was witnessed by physicians and the eyeball was removed from its place, there never was any other result but complete destruction of the eye.

Professor Imre believes that even if the optic nerve could grow again, a condition which has never been established, and even if there were a possibility of transplanting a complete eye from one man to another, the question could not have any practical importance, because no physician should be allowed to, and no physician with any conscience, would remove an eye with good vision for making a rather uncertain experiment.

Following the publication of Prof. Imre's article, Prof. A. J. Carlson, of

the department of physiology in the University of Chicago, replied on behalf of the scientific status of Dr. Koppányi's work. Prof. Carlson points out that Dr. Koppányi has been on the research staff of his laboratory in the University of Chicago since January, and that such newspaper stories as have appeared have not been authorized either by Dr. Koppányi or by the laboratory. Experiments have been made on spotted rats, and the transplanted eyes have undergone varying degrees of change from complete destruction to mere cloudiness of the tissues. Most of the cause for failure is believed to be secondary infection.

In the most successful experiments, the transplanted eye appears normal in size; the cloudiness clears up, and so far as the scientists have been able to determine there may be some return of vision. Prof. Carlson has controlled Dr. Koppányi's work and believes that it demonstrates definitely that transplantation can be carried out with at least partial success on the spotted rat. He points out that it remains to be seen whether such results can be duplicated in the dog and the monkey, and if this is achieved, there still remains a very high percentage of complete or partial failure which must be converted into success before anyone would be justified in attempting any such operation on man.

Supplementing the letter of Prof. Carlson, Dr. Koppányi declares that the charges of Prof. Imre that he gave unwarranted publicity to his work, stating that the return of vision is possible, and admitting that the optic nerve was not cut in his eye transplantation experiments, are not true.

NEW BOTANICAL EXPEDITION RECALLS OLD ROYAL ROMANCE

A woman botanist, Mrs. Agnes Chase of the U. S. National Herbarium, recently sailed for Brazil on a collecting expedition into the interior that recalls a romantic incident in the history of the South American republic as well as one of the classical eras in botanical work on that continent.

In 1807 Dom John VI, King of Portugal, fled before the invasion of his country by Napoleon and sought refuge in his colony of Brazil. While he was in exile, a royal marriage was arranged between his son, later known as Dom Pedro, the first Emperor of Brazil, and Princess Leopoldina of Austria.

When the royal bride came to the New World to join her husband, the personnel of a scientific expedition was included in her entourage. A Bavarian botanist, Carl von Martius, was head of the expedition. The party secured large collections of the Brazilian flora, which have become the type specimens for many South American species. The principal botanical collection of von Martius is now at Brussels. The route traveled by this expedition of over a century ago has never been retraveled.

Mrs. Chase made a careful study of the von Martius collection at Brussels in 1922, and now plans to work in part of the territory covered by his expedition between now and May of next year. She will traverse the great grassy plateau that lies on the "elbow" of eastern Brazil, from Pernambuco on the north to Sao Paulo in the south. Part of the country to be traveled is mountainous, with elevations up to 5,000 feet.

Mrs. Chase expects to concentrate her attention on grasses, in which this upland is especially rich. In addition to securing botanical specimens for the National Herbarium, she will collect seeds of species of possible economic importance for the Bureau of Foreign Seed and Plant Introduction of the U. S. Department of Agriculture.

MEDICAL FELLOWSHIPS AWARDED TO FOURTEEN SCIENTISTS

Fourteen graduates in science have been awarded medical research fellowships by the National Research Council, for special training in teaching and important investigational work in the various branches of medicine and the medical sciences.

The newly appointed fellows are in addition to the twenty-nine already at work under grants from the Medical Fellowship Board of the National Research Council. The actual research is conducted at various institutions throughout the world and about a fifth of the fellows study abroad.

Whether a fellow is married or single the time of appointment determines in part the compensation that is granted him from the fellowship fund made available to the National Research Council by the Rockefeller Foundation and the General Education Board. An unmarried fellow receives \$1,800 a year, while a married man receives \$500 more.

Many of the fellows before the expiration of their fellowships have been invited to fill desirable teaching and research positions.

Those who have just been appointed and the institutions where they will work are: Dr. Emily B. Carrier, Harvard University; Dr. Benjamin Freeman, University of Pennsylvania; Dr. M. S. Hollenberg, Johns Hopkins University; A. E. Hirsky, University of Cambridge; England; Dr. H. L. Pelham, Columbia University; Dr. Bernhard Steinberg, Western Reserve University; Dr. F. W. Stewart, Boston City Hospital; Dr. G. J. Strean, University of Iowa; Dr. C. H. Theines, Stanford University; Drs. J. L. Goforth, Erida L. Leuschner and H. B. Van Dyke, place not yet determined; Dr. Frederick P. Gay of Columbia University is chairman of the Medical Fellowship Board.

TABLOID BOOK REVIEW

RELATIVITY FOR PHYSICS STUDENTS. By G. B. Jeffreys, New York, E. P. Dutton and Company. \$2.40.

Although 3,700 books have been written about Einstein's theory of relativity in the last ten years, this new one fills an unoccupied niche since it falls between the extensive mathematical treatises and the popular expositions. It consists of lectures given by the Professor of Mathematics at Kings College, London, and is adapted to provide an introduction to the study for those who are somewhat familiar with mathematics and physics.

"Hen's teeth" were not scarce in dinosaurian times; the earliest fossils of birds have large numbers of sharp teeth.

Although sea water contains far more chlorine than it does iodine, sea plants contain more iodine than chlorine.

The dahlia is a native of Mexico.

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